Forces Higher **Revision Mat**

1. Name **three** non-contact forces.

Name **two** resistive forces.

Name **two** other forces.

2. Give the unit that is used for measuring forces.

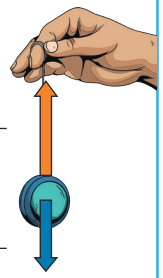
Name the piece of equipment used to measure force.

3. An object has a mass of 600g.
What is its mass in kilograms (kg)?

4. Give three things that might happen to an object if the forces on it are unbalanced.

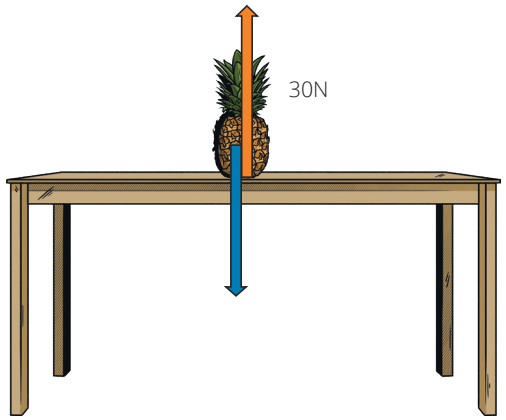
5. The diagram shows a yo-yo being used.

Label each arrow with the name of the force



A resistive force will also affect the movement of the yo-yo. What is the name of that force?

6. The diagram shows an object on a table.



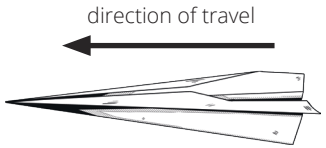
The reaction force of the table acting on the object is 30N. What is the weight of the object?

7. Write down the equation that links gravitational field strength, mass and weight.

8. The diagram shows a paper aeroplane that has been thrown across the room and is travelling forwards.

Draw an arrow on the diagram to show the direction of the gravitational force on the aeroplane. Label it A.

Draw an arrow on the diagram to show the direction that air resistance acts on the aeroplane. Label it B.



9. The mass of an object is 15kg.
The gravitational field strength on Earth is 10N/kg.

What is the object's weight on Earth?

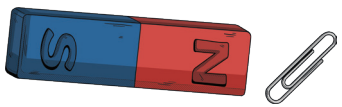
The object is taken to Mars. Its mass does not change. Its weight on Mars is 55.5N.

What is the gravitational field strength on Mars?

10. A car has a mass of 2000kg.
Calculate its weight on Earth.

The car is used to drive to a holiday destination, using a full tank of petrol. The weight of the car after the journey is 19 200N. Calculate the mass of the car after the journey.

11. A paperclip is placed into the magnetic field around a magnet.

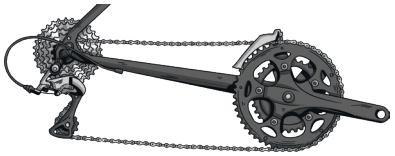


What happens to the strength of the force experienced by the paperclip as it is moved further away from the magnet?

_____

_____

12. The diagram shows a bike chain.



Before starting a race the cyclist oils the chain. Explain why.

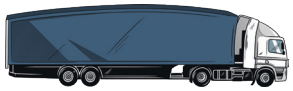
_____

_____

_____

13. The diagram shows two lorries.

lorry A



lorry B

The lorries have the same mass and produce the same thrust force from the engine.

Which lorry will travel the fastest?

_____

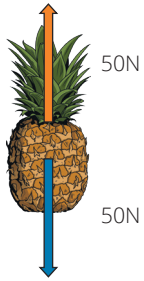
Explain why.

_____

_____

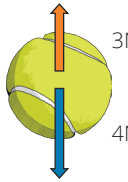
_____

14. For each of the examples below, tick one box to show whether the forces acting on the object are balanced or unbalanced.



balanced ☐

unbalanced ☐

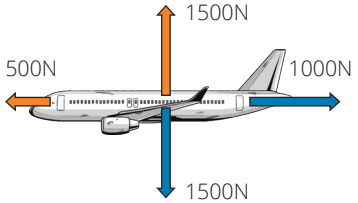


balanced ☐

unbalanced ☐

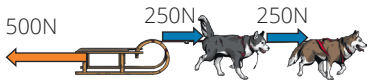
balanced ☐

unbalanced ☐



balanced ☐

unbalanced ☐



balanced ☐

unbalanced ☐

15. The diagrams show the forces acting on three cars moving forwards.

Describe what happens to the motion of each car.

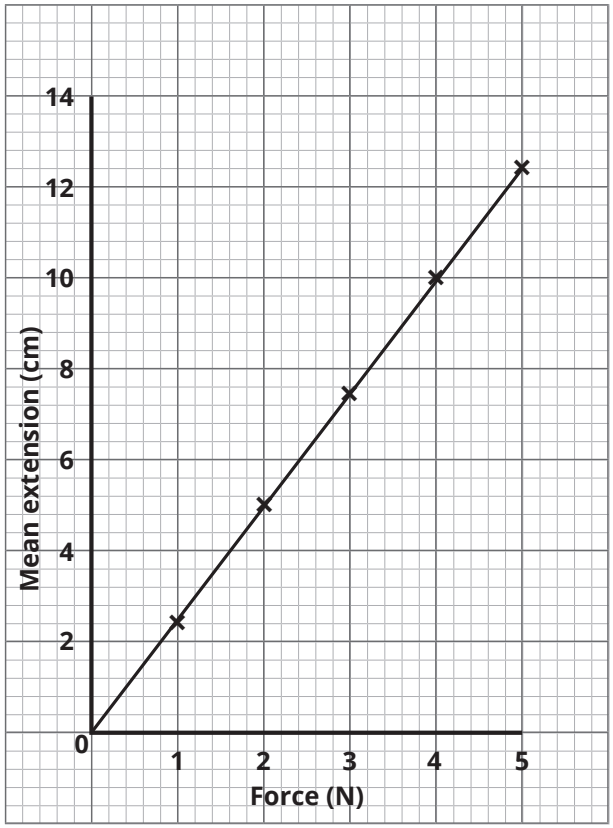
The car _____.

The car _____.

The car _____

_____

18. Some students investigate how the extension of a spring is affected by the force applied to the spring. They plot their results on the graph below.



Describe the relationship between the force applied to a spring and the extension of a spring.

Give the name of the law that describes this relationship.

19. Write down the equation that links extension, force and spring constant.

A spring has a spring constant of 20N/m and is extended by 0.2m.

Calculate the force applied to the spring.

20. A force of 6N is applied to a spring with a spring constant of 16N/m.

Calculate the extension of the spring in cm.

A further 4N is applied to the spring. After 2N the spring reaches its elastic limit.

Describe what happens to the relationship between the extension and the force applied after this point.

Forces Higher **Revision Mat Answers**

1. Name **three** non-contact forces.

gravitational

magnetic

electrostatic

Name **two** resistive forces.

Any two from:

friction

air resistance

water resistance

drag

Name **two** other forces.

Any two from:

tension

reaction

or any of the resistive forces not mentioned above.

2. Give the units that are used for measuring forces.

newtons (N)

Name the piece of equipment used to measure force.

newton meter

3. An object has a mass of 600g.
What is its mass in kilograms (kg)?

0.6kg

4. Give three things that might happen to an object if the forces on it are unbalanced.

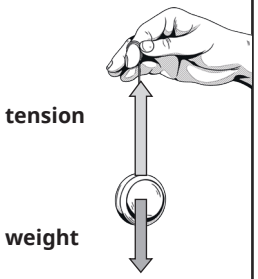
change direction

accelerate

slow down

5. The diagram shows a yo-yo being used.

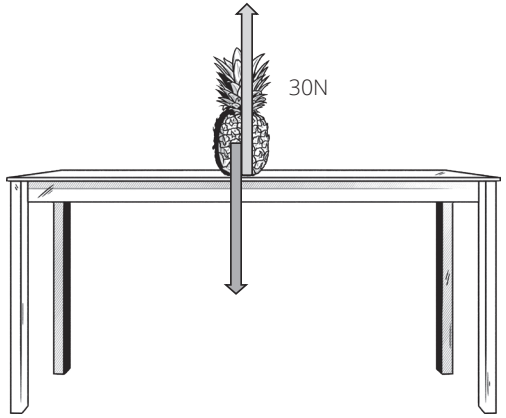
Label each arrow with the name of the force



A resistive force will also affect the movement of the yo-yo. What is the name of that force?

air resistance

6. The diagram shows an object on a table.



The reaction force of the table acting on the object is 30N. What is the weight of the object?

30N

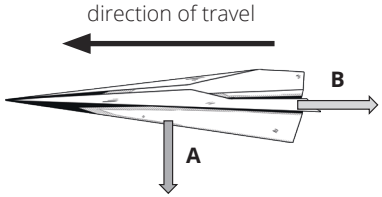
7. Write down the equation that links gravitational field strength, mass and weight.

weight = mass × gravitational field strength

8. The diagram shows a paper aeroplane that has been thrown across the room and is travelling forwards.

Draw an arrow on the diagram to show the direction of the gravitational force on the aeroplane. Label it A.

Draw an arrow on the diagram to show the direction that air resistance acts on the aeroplane. Label it B.



9. The mass of an object is 15kg.
The gravitational field strength on Earth is 10N/kg.

What is the object's weight on Earth?

15kg × 10N/kg

150N

The object is taken to Mars. Its mass does not change. Its weight on Mars is 55.5N.

What is the gravitational field strength on Mars?

gravitational field strength = weight ÷ mass

55.5N ÷ 15kg

3.7N/kg

10. A car has a mass of 2000kg.
Calculate its weight on Earth?

2000kg × 10N/kg

20 000N

The car is used to drive to a holiday destination, using a full tank of petrol. The weight of the car after the journey is 19 200N. Calculate the mass of the car after the journey.

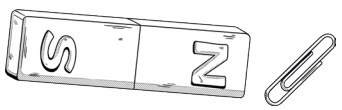
mass = weight ÷ gravitational field strength

mass = 19 200 ÷ 10 = 1920kg

Forces Higher **Revision Mat Answers**

11.

A paperclip is placed into the magnetic
field around a magnet.



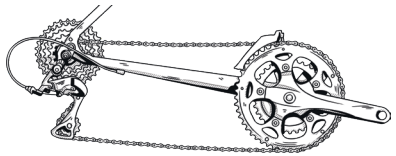
What happens to the strength

of the force experienced by the paperclip as it is moved further away from the magnet?

The force decreases.

12.

The diagram shows a bike chain.



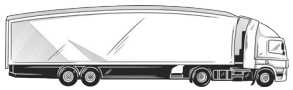
Before starting a race the cyclist oils the chain. Explain why.

The oil acts as a lubricant which reduces friction between the chain and the gears/ wheel/cogs and means the bike can go faster.

13.

The diagram shows two lorries.

lorry A



lorry B

The lorries have the same mass and produce the same thrust force from the engine.

Which lorry will travel the fastest?

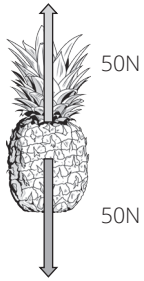
lorry A

Explain why.

Lorry A is streamlined which means it has lower air resistance/drag than lorry B so it is slowed down less.

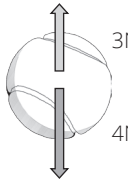
14.

For each of the examples below, tick one box to show whether the forces acting on the object are balanced or unbalanced.



balanced ☑

unbalanced ☐

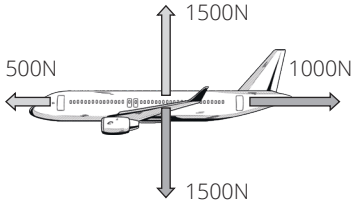


balanced ☐

unbalanced ☑

balanced ☐

unbalanced ☑



balanced ☐

unbalanced ☑

balanced ☑

unbalanced ☐

15.

The diagrams show the forces acting on three cars moving forwards.

Describe what happens to the motion of each car.

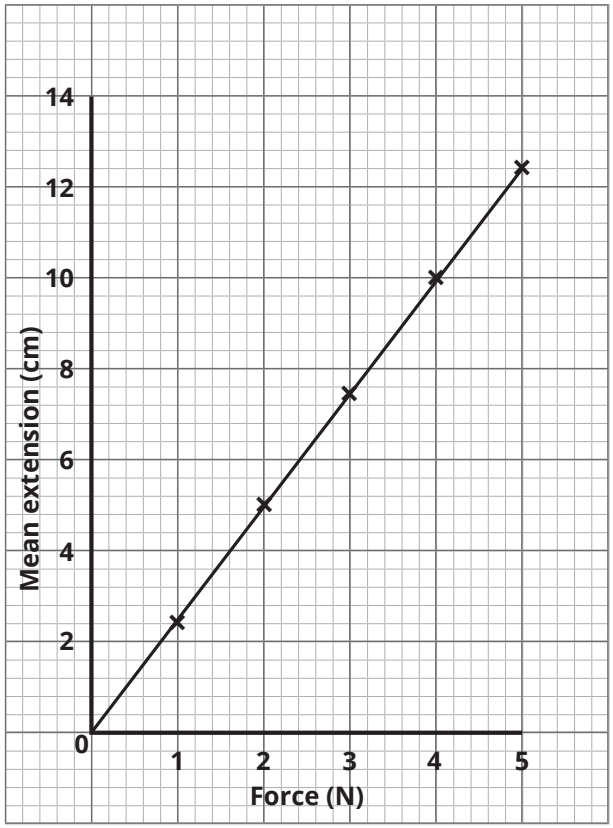
The car **slows down**.

The car **speeds up**.

The car **continues at a constant speed. There is no change in the motion of the car.**

18.

Some students investigate how the extension of a spring is affected by the force applied to the spring. They plot their results on the graph below.



Describe the relationship between the force applied to a spring and the extension of a spring.

The extension of the spring is directly proportional to the force applied to the spring.

Give the name of the law that describes this relationship.

Hooke's law

19.

Write down the equation that links extension, force and spring constant.

force (N) = spring constant (N/m) × extension (m)

A spring has a spring constant of 20N/m and is extended by 0.2m.

Calculate the force applied to the spring.

20 × 0.2

4N

20.

A force of 6N is applied to a spring with a spring constant of 16N/m.

Calculate the extension of the spring in cm.

6 ÷ 16 = 0.375m

0.375 × 100 = 37.5cm

A further 4N is applied to the spring. After 2N the spring reaches its elastic limit.

Describe what happens to the relationship between the extension and the force applied after this point.

The extension and the force applied are no longer directly proportional. The relationship no longer obeys Hooke's law.